

**METHOD, APPARATUS AND SYSTEM FOR  
HIGH-SPEED TRANSMISSION ON FIBER OPTIC CHANNEL**

**ABSTRACT OF THE DISCLOSURE**

Multi-carrier modulation fiber optic systems constructed using a series of electrical carriers, modulating the data on the electrical carriers and combining the carriers to form a wideband signal. The wideband signal can then be intensity modulated on a laser and coupled to a fiber optic channel. A receiver may then receive the laser signal from the fiber optic channel and convert it into an electrical signal. Multi-carrier modulation may be applied to existing fiber channels, which may be of lower quality. Existing fiber channels may have characteristics which prevent or restrict the transmission of data using intensity modulation at certain frequencies. An adaptive multi-carrier modulation transmitter may characterize an existing fiber optic channel and ascertain the overall characteristics of the channel. The transmitter and receiver can then be configured to use various bandwidths and various modulations in order to match the transfer characteristic of the fiber channel. A series of adaptive multi-carrier modulation transmitters and receivers can be integrated on a single integrated circuit. If multiple adaptive receivers and transmitters are integrated on a single integrated circuit, they may be used to upgrade existing networks by adding different wavelength lasers for the transmission of data in order to achieve any capacity desired. Each receiver and transmitter may characterize the fiber for its particular wavelength laser and may configure the modulation and bandpass to the fiber's characteristics.

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